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## THE AMERICAN ZODIAC

By STANSBURY HAGAR

**I**N a recent article Dr. Herbert J. Spinden states his conviction that, while the existence of a native zodiac in Central America is an open question, evidence relating to it is practically undeveloped, and the age-long fallacy of pre-Columbian introduction from Europe or apparently from anywhere else outside of America, should be dismissed.<sup>1</sup> He also criticises many of my papers on the subject and also those of other writers.

As the late Mark Twain wrote, it is difference of opinion that makes horse-racing, and the same cause impels me to present my opposing views for the consideration of students. I wish to establish truth, whether my present view of it be right or wrong. For many years in the *Anthropologist* and the publications of the International Congress of Americanists, I have asserted from conviction the existence of a native zodiac in America which presents a very similar aspect in Peru, Yucatan, Mexico, and among the Pueblo tribes of our own country. The existence of this zodiac is, of course, entirely independent of the question as to whether it has been derived or influenced from the eastern continent. One can accept its existence in America and deny oriental influence. My conviction is, however, that the analogies between the oriental zodiacs and the various forms of American zodiacs are too arbitrary and complex to be satisfactorily explained otherwise than by intercommunication. But I have carefully refrained from pretending to any knowledge as to when, how, or where, intercommunication occurred beyond the limitation that it was accidental and sporadic, not the result of any general migration, and that it took place at least many centuries prior to the Spanish conquest.<sup>2</sup>

<sup>1</sup> "The Question of the Zodiac in America," *American Anthropologist* (N.S.), vol. 18, pp. 53-80. Subsequent references to pages included in parentheses in the text are to this paper.

<sup>2</sup> Hagar, *American Anthropologist* (N.S.), vol. 14, pp. 43-48.

Therefore, I have not eliminated the possibility of communication from western Europe nor have I insisted upon the Chinese junk or the Phoenician galley which seem to disturb Dr. Spinden's equanimity, although I regard them as strong possibilities (p. 56). In answering Dr. Spinden's criticism of my papers I will not deceive myself with the belief that I can hurl thunderous phrases or heavy projectiles of opinion from the impregnable cliffs of authority and infallibility upon the forlorn hope of those attacking my views from below. On the contrary I welcome sincere criticism which seeks to establish truth by understanding and justly appreciating an opponent's views, trying to state them as that opponent would state them, and then pointing out those errors, whether of principle or detail, into which every student in a new field is liable to fall.

First, as to the existence of a zodiac in America. Perhaps the most important element in the structure of these studies is sequence. Evidence relating to the signs of the zodiac is usually found not here as to one sign and there as to another, but in direct continuous and complete sequence, occurring in many different forms of art, architecture, ceremonials, and calendar divisions. The only exceptions in the entire field are the more complex sequences of the Peruvian star chart of Salcamayhua and the plan of Teotihuacan. The identification of any two signs in one of these sequences absolutely determines the position of all the others. The symbols of all must then be consistent in the positions indicated or the identification fails. Also wherever the existence of a zodiac is suspected its entire series of symbols must harmonize throughout in continuous and unvaried sequence with the sequence of other representations of the zodiac. The harmony must be complete between the different series as a whole and between at least many of their corresponding parts. Surely it must be apparent that under such a rigid limitation it is highly improbable that a zodiacal sequence can be constructed by chance or imagination or manipulation in any form. It can only exist because it was designed to exist by some human mind. Conversely every zodiacal sequence found adds immeasurably to the improbability of accident or imaginative manipulation.

It is not possible to justify in detail the writer's claim to have shown such sequences within the limits of this paper. He can only refer to his published papers and give here the results explained in them.

In Peru the evidence is based upon five principal sequences. First there is the star chart of Salcamayhua, an Aymara or Colla Indian who wrote about 1613 "to show what these heathens thought." He is generally regarded as a reliable authority. On this chart the signs of the zodiac are depicted in three vertical columns of four signs each, every sign being three signs distant from its neighbor vertically and four signs distant horizontally.<sup>1</sup> Next there are the twelve wards of Cuzco arranged in a circle around the sacred city of the Inca and each bearing the name of a zodiacal sign. The purpose was to imitate upon earth the celestial design of the sky and thereby to bring down some of the perfection of the celestial world. The Skidi Pawnee of our own country today exhibit a similar concept in the arrangement of the village groups of their tribal encampment so that their relative position corresponds with the relative position of the asterisms to which their shrines are dedicated.<sup>2</sup> These wards of Cuzco are named and located by Garcilasso de la Vega, and, in later times, by Squier and Wiener from undoubtedly ancient tradition. Many of them are mentioned in connection with early events in the city's tradition or history.

Within Cuzco were eleven districts which also bore the names of zodiacal signs, one district having apparently been forgotten. They are mentioned by the same authorities and are arranged in a continuous meander.<sup>3</sup> In the outskirts of Cuzco were groups of shrines divided into ceques, so called, which also reveal zodiacal influence. Finally, the ritual of the twelve monthly festivals celebrated in Cuzco and throughout the Inca dominion presents a

<sup>1</sup> Hagar, *International Congress of Americanists*, XII Session, Paris, 1900, pp. 271-284.

<sup>2</sup> Fletcher, Alice C., *American Anthropologist* (N.S.), vol. 4, pp. 731-733; Dorsey, G. A., "Traditions of the Skidi Pawnee," *Memoirs, American Folk-Lore Society*, vol. 8.

<sup>3</sup> Hagar, *International Congress of Americanists*, XIII Session, New York, 1902, pp. 217-225.

zodiacal sequence which indicates that the rites of each festival were directed to the sign through which the sun was passing at the time the festival was held. This ritual is described with minor variations by almost all the early writers on Peru.<sup>1</sup> Blas Valera, probably the best authority on ancient Peru, writes that the Peruvians gave different powers to their zodiacal signs such as the llama, puma, serpent, and plants. Each asterism was believed to have the form of the animal or object that it governed and images were made of all these constellations. There was a temple in the Amaru Caucha district of Cuzco dedicated to the sign Scorpio in the form of a serpent or dragon holding a scorpion in its mouth.<sup>2</sup> Calancha also mentions the Puma asterism as a sign of the Peruvian zodiac and identifies it with our Leo. Other early writers upon Peru refer to several of the constellations included in the various sequences but seldom attempt to identify them. As yet the writer has been able to publish only an outline of the evidence bearing upon the Peruvian zodiac, but the harmony of the Peruvian sequences backed by these authorities should suffice to establish its existence.

In Yucatan the zodiacal sequences comprise drawings in the Dresden and other codices, mural inscriptions at Acanceh and Santa Rita, celestially planned cities at Uxmal and Izamal, a vigesimal division of the zodiac among the twenty Maya days of the uinal period or month and the ritual of the festivals divided among the eighteen uinals of the year.<sup>3</sup> The sequence is simple, direct, and practically unvaried in all cases, and here we depend much less upon tradition than in Peru because the symbols of the codices and inscriptions and the glyphs of the uinals and days provide impressive testimony independent of external authority. Yet the three oldest and best authorities upon Maya matters, Landa, Lizana,

<sup>1</sup> Hagar, *International Congress of Americanists, XIV Session, Stuttgart, 1904*, pp. 593-602.

<sup>2</sup> *Relacion Anonima in Tres Relaciones de Antiguedades Peruanas*, M. J. de la Espada, Madrid, 1879.

<sup>3</sup> Hagar, *International Congress of Americanists, XVI Session, Vienna, 1908*, pp. 277-300; *XVII Session, Mexico, 1910*, pp. 140-159; *XIX Session, Washington, 1915*; *American Anthropologist* (N.S.), vol. 15, pp. 16-32; vol. 16, pp. 88-95.

and Cogolludo, contribute their share to the evidence. The explanation of Uxmal is partially dependent upon it; Izamal almost wholly so. As in Peru, the pre-columbian age of all the sequences, and their freedom from later European influence cannot be questioned. No early writer either asserts or denies the existence of a Maya or Mexican zodiac, but a number of symbols are known to represent asterisms, some of them zodiacal. Below the Acanceh inscription is a series of symbols now generally recognized as those of the planet Venus. Seler interprets others of the same planet on a constellation band at Chichen Itza as representing that planet in conjunction with a series of asterisms which must be zodiacal since planets travel only through the zodiac.<sup>1</sup> Spinden refers to another probably zodiacal sequence from the Codex Peresianus (p. 77). Excluding from these two sequences the symbols of Venus, the moon, and the peccary, all the other symbols have already been identified by me with definite zodiacal signs. Again, the ecliptic itself is represented as a rope with its northward and southward course correctly depicted among the symbols of the signs at Mitla, Santa Rita, and on sheet 19 of the Codex Cortesianus.

The lack of direct mention of the zodiac by early writers may be accounted for by its sacred and esoteric nature. Knowledge of it was probably always confined to the few highly instructed ones, and they exhibited little longing to teach their intolerant Spanish conquerors.

In Mexico there are numerous zodiacal sequences in the native codices, perhaps the most important being those in the Borgiano, Bologna, Vaticanus 3773, and Laud. In the three first named the governing deities of the six signs above hurl spears at the deities of the six signs below, hence the group is known as the spear throwers. Most important are the drawings and descriptions of the zodiacal asterisms in their proper sequence in the writings of Sahagun, Tezozomoc and Duran. The two former named five single and one double sign, hence six signs in all, which the Mexican king is supposed to rise at midnight to observe. They positively

<sup>1</sup> *International Congress of Americanists, XVI Session*, pp. 150-239.

identify the Mexican scorpion asterism with our Scorpio. Duran calls his asterisms planets, but as all are associated with one of the twenty-day months, they evidently pertain to the zodiac. These asterisms outnumber the planets and no planet can bear any uniform continuous relation with any month. The eighteen Mexican months and their festivals, the twenty days of the month, the celestial plan of Teotihuacan and the Zapotec mural paintings at Mitla also reveal zodiacal sequences.<sup>1</sup>

Among the Pueblo the monthly ritual exhibits an unmistakable zodiacal sequence, the existence of which has been definitely proven by the identification of several signs by the Hopi for me at the First Mesa in September, 1915, and the independent statements of several Hopi to me that all their rites honor the stars through which the sun is passing at the time they are performed. This adds to the testimony of archaeology and tradition the evidence of living Indians who still perform the zodiacal ritual.

Very likely there are a number of other zodiacal sequences in America which the author has not encountered, but, using the material described, he would ask: Independent of its meaning, has not the existence of an analogous sequence of symbols been shown in Peru, Yucatan, Mexico, and among the Pueblo, pervading the most important concepts of art, religion, architecture, and rites? Can this sequence be explained on any basis other than the zodiacal? Is the zodiacal interpretation of it unsatisfactory?

I will now try to answer Dr. Spinden's criticisms. In general he asserts that no first-rate authorities among the early writers on Mexico or Peru favor the existence of a native zodiac in America (p. 53). This is incorrect, as shown above. But a native zodiac could not have existed in Peru, because Garcilasso de la Vega, "our best authority on the civilization of the Inca" denies it (p. 70). Dr. Spinden apparently is not aware that the Anonymous Jesuit, who asserts the existence of the Peruvian zodiac, has recently been identified with Blas Valera, from whom Garcilasso quotes exten-

<sup>1</sup> Hagar, *International Congress of Americanists*, XVI Session, Vienna, 1908, pp. 277-300; XVII Session, Mexico, 1910, pp. 140-172; *American Anthropologist* (N.S.), vol. 13, pp. 229-234.

sively, and with expressions of great respect for his knowledge and learning. There is indeed a strong suspicion that Garcilasso's work is largely based on the lost work of Blas Valera, of which the Anonymous Jesuit is but a fragment. This identification was made by Dr. Gonzalez de la Rosa and was accepted by Sir Clements R. Markham. The latter describes Blas Valera as by far the greatest of clerical writers upon Inca civilization and as having qualifications and advantages possessed by no other writer. Both he and Garcilasso were half-blood Quichua, but the former wrote in Peru. His writings show an intimate acquaintance with the arcana of Peruvian religion and knowledge. Garcilasso went to Spain at the age of twenty and never returned to Peru. He was then too young to have mastered the sacred things of the Inca and he did not write of Peru till thirty-six years later, so that his negative statements are far from certain. Blas Valera rather than Garcilasso is entitled to be called the best authority on any subject he mentions.<sup>1</sup> Salcamayhua, a pure-blood Aymara or Colla, wrote in 1613 what Dr. Spinden terms a crude seventeenth century manuscript supported only by some priestly writings (Blas Valera and Calancha) (p. 69). But Acosta, a Spanish priest who published in 1590, is quoted with approval (p. 70). On the Salcamayhua chart I identify four signs by roundabout arguments and then assume that the rest fill out the zodiac (p. 69). Being tied down by the sequence throughout I cannot assume anything.

Because of that sequence it does not matter at what point I begin the argument. The choice is purely personal. We know nothing more of the Puma star than that it is somewhere in the heavens (p. 69). It is identified with Leo by Calancha and with a sign of the Peruvian zodiac by Blas Valera as previously stated.

The "harvest" asterism cannot be the Pleiades because they are also called "the granary." It is ridiculous to suppose that the "crude sketch" of this asterism can represent both a cloud and an ear of maize (p. 69). It is not unusual for the American Indians to delight in seeing more than one meaning in a single form; for instance, the widespread use of the castellated terrace to represent

<sup>1</sup> See Markham, *The Incas of Peru*, pp. 12-14, 263, 275, 278.

both clouds and mountains and the translation of Quetzalcoatl as both Bird Serpent and Celestial Twin. The Aquarius asterism is identified by means of Assyrian symbolism (p. 69). Really by the sequence, the Euphratean analogy is merely stated. The stars of Scorpio cannot present at once the figure of a tree and a mummy (p. 69). A number of people have correctly identified both for me when I only indicated to them the general section of the sky in which to look. These identifications are tenuous, the rest beyond discussion (p. 70). I cannot sincerely express regret that my opinion differs as to this; but neither opinion proves anything. There is no detailed criticism of the other Peruvian sequences.

Passing to the Mexican and Maya sequences, Dr. Spinden objects to the division of the ecliptic among four independent series of asterisms comprised of ten, twelve, eighteen, and twenty members (p. 58). The so-called series of ten does not exist. This is explained below and also in my paper, but not by Dr. Spinden. The existence of three other series would be extraordinary. A study of Duran's drawings, which seemed to furnish evidence of asterisms pertaining to the months, has convinced me that no such series existed. Duran figures the eighteen months in connection with the monthly festivals and the details of these festivals show the influence of the zodiacal sequence. Undoubtedly they were governed by the zodiacal asterisms, probably both of the normal and day signs series. But they cannot represent an independent series of asterisms because only eleven asterisms are actually represented in a series of eighteen months and an intercalary period. These asterisms are scattered irregularly among the months and it is plain that the greater number of them, if not all, pertain to the day signs series. If each month were correlated with a particular asterism surely Duran would not have omitted so many asterisms. But if the months were merely governed by certain day signs used in sequence but without correlation in time we can understand why he might not consider it necessary to reproduce them all. This reduces the Maya and Mexican zodiacal asterisms to two series, the normal and the day signs. Two independent series of zodiacal asterisms are also found in India and Arabia. I owe thanks to Dr. Spinden for indirectly suggesting this correction.

The royal asterisms of Tezozomoc and Sahagun are described as one half of a ten part zodiac derived from native books and random information from Spanish writers of the second crop (p. 58). Here Dr. Spinden might not improperly have explained that one of the five signs mentioned is interpreted as the double sign Libra-Scorpio. The figure of the scorpion which covers both these signs is so conspicuous and unique in the sky that probably the desire to retain it as a whole led the ancient Maya and Mexicans as well as the ancient Greeks to figure it in some of their zodiacs as a single constellation covering two signs. The figure is badly distorted in our curtailed constellation. The Maya and Mexicans seem to have extended its opposite constellation in similar manner, perhaps for symmetry, thus forming a zodiac of eight single and two double asterisms. These corresponded with twelve signs presenting merely a variant form of the normal zodiac. The five royal asterisms therefore covered six signs or half of the zodiac, exactly the number of zodiacal asterisms that would be visible to the Mexican king when he went out under the night sky to observe them. This may seem somewhat more plausible than Dr. Spinden's statement of the case and to whatever crop of authors Sahagun pertains we undoubtedly owe to him more valuable information relating to ancient Mexico than is afforded by any other writer.

Numerous explanations of the Mamalhuaztli asterism are given which demonstrate the uncertainty regarding its position in the sky (pp. 58, 59). None of them are supported by a sequence or correspond with other symbols having a like position in other sequences.

Tianquitzli, the Market asterism is identified with the Pleiades by Tezozomoc (p. 59). It is the only instance among the five asterisms in which the sequential interpretation compels me to oppose either Tezozomoc or Sahagun. The view that the former is mistaken in this instance is supported by the impossibility of reconciling the outline of the asterism given by Sahagun with the Pleiades and by Tezozomoc's marked uncertainty about the other asterisms except the unmistakable Scorpion. The Mexican summary supports the sequential identification with Virgo.

The five asterisms could not have formed a continuous series along the ecliptic because Tezozomoc states that the first four marked the four directions (p. 61). On the contrary all the Mexican zodiacal signs seem to have been associated with certain cardinal directions, perhaps in more than one system. One assignment was based upon a natural comparison of the daily and annual course of the sun, rising in the east at the vernal dawn of the year, attaining his farthest north at the summer solstice, receding into the west at the autumnal equinox, and departing into the south during the winter. The equinoctial signs were accordingly placed east and west and the solstitial signs north and south and each of these four major signs carried with it its neighbor on each side, thus dividing the zodiac into four triplicities each assigned to a cardinal point. The association of the Mexican and Maya years with different cardinal points is well known. Perhaps Tezozomoc mentioned the four sequential signs not as referring each to a different cardinal point but as part of the zodiac which governed all four (p. 58). We may leave the royal asterisms with a denial that Sahagun places Mamalhuatzli in Taurus (p. 61). In Book 7, Cap. 3, he identifies the Mastalejos, the same asterism, with stars "near the Pleiades, which is (are in) the sign of the Bull."<sup>1</sup> According to his statement they may or may not be in Taurus.

The sequence of the Spear Throwers is objected to because it is associated with certain calendrical calculations that apparently pertain to revolutions of the planet Venus (p. 61). But whether sideral or synodical I can see nothing in them inconsistent with a basic zodiacal significance supplemented by Venus periods. The influences of Venus mentioned on page 62 are exerted from the zodiacal asterisms of the day signs against their opposite asterisms whose symbolism is correctly stated in sequence thus paralleling the scheme of the Spear Throwers in the day signs sequence.

The impressive correspondence between the sequential symbolism of the day signs and that of other zodiacal series is called a monument to ingenuity (p. 62) and no reference is made either

<sup>1</sup> Los mastelejos del cielo, que audan cerca de las cabrillas que es el signo del toro, Lib. 7, Cap. 3.

in the text or bibliography to the additional correspondence between the zodiacal positions of the day signs as identified by me and their relations with the rainy and dry seasons as figured in the Codex Vaticanus 3773.<sup>1</sup>

On the Aztec Calendar Stone (p. 62) I place Cipactli of the circle of day signs at the summer solstice because it is found at the top of the circle above the central solar head corresponding with the northernmost or topmost position of the sun in its annual course. The positions of all the other signs are then determined by the sequence. This is my only venture and I consider that its correctness is strongly confirmed. It is explained in my paper but not by Dr. Spinden. The day signs are unequally distributed among the signs probably because their asterisms were of unequal size. Evidence of their association with zodiacal asterisms is furnished by the correspondence between their sequence and other zodiacal sequences, their association with zodiacal sequences in codices, inscriptions, constellation bands, and ritual, and with the rainy and dry seasons in the Codex Vaticanus 3773. The Maya day sign Manik offers additional and impressive evidence on this point in the correspondence between its meaning, the Grasping Hand, and the configuration of the tail of the Scorpion, to which asterism it must be assigned in the sequence.<sup>2</sup> Seler regards the nine lords of the night of the Mexican codices as probably stars or constellations.<sup>3</sup> Each lord is accompanied by a day sign in correct sequence and the whole represents one less than half the asterisms of the vigesimal zodiac, practically all that are visible at a given moment, and they cover exactly the same half of the zodiac as the royal asterisms of Sahagun and Tezozomoc. Why ten lords were not represented is unknown to me.<sup>4</sup> The argument that the discrepancy between

<sup>1</sup> International Congress of Americanists, XVIII Session, pp. 137-140.

<sup>2</sup> Hagar, International Congress of Americanists, XVII Session, Mexico, 1910, pp. 140-159; *American Anthropologist* (N.S.), vol. 17, pp. 488-491.

<sup>3</sup> *Codex Fejervary-Mayer*, Loubat ed., p. 48.

<sup>4</sup> Seler also associated the twenty day signs with twenty stars but later found possible difficulties with this point of view which I fail to understand (See *Codex Fejervary-Mayer*, p. 171). Mrs. Nuttall asserts that they constitute a native zodiac but makes no attempt to identify any day sign with any part of that zodiac. (See *Fundamental Principles*, p. 255.) Humboldt and Beyer attempt to identify the

my zodiacal identifications of the day signs and those of other students of the subject proves the error of all (p. 65) is somewhat amusing, for it is the very argument that theologians have used and still use to disprove the truth of evolution. In every new field of study divergent views are almost inevitable as to details and they continue to exist long after the main principles have been established.

The next objection is that, as the leap year error was not interpolated in the Mexican or Central American year counts, although calculated very accurately, the months thus fell behind the seasons at the rate of about twenty-four days in a century. Hence the months could not possibly maintain a close time relation with the signs of the zodiac (pp. 65, 66). Granted, but need we assume that they did? I have explained above that the months possessed no zodiacal asterisms of their own, but were probably governed both by the twelve normal signs and the twenty asterisms of the day signs, also that these asterisms governed the months in sequence but as in our own zodiac, were not correlated with them in time. The principal use of the zodiac was divinatory rather than calendrical. However, the symbolic sequence was probably established at some date when it did synchronize with the months, but the subsequent divergence was disregarded as it is by us. Facts indicate that the only direct calendrical relations of either normal or day signs zodiac were with the annual festivals and that the dates of these festivals were determined by actual observation of the stars as they still are among some of the tribes of the United States.

But the Mexican and Maya months do not coincide in time as given in my sequences (p. 67). Probably because they were correlated with the zodiac at different dates. The sequence is similar in both and that is the critical element in these studies. Their present calendrical relations are not important in this field.

Scorpion figures in the Tro-Cortesianus codex do not represent the Scorpion asterism because they are associated with pictures

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asterisms of some of the day signs with different results from mine and Granados seems to assert their zodiacal basis without attempting identification (pp. 63, 64).

of hunting (p. 68). Can they be pictures of scorpions actually hunting deer? The identification of the Scorpion with Scorpio; of Scorpio with the month Tzec, the Scorpion; of the grasping hand inserted in place of the scorpion's sting with the day-sign, Manik or Grasping Hand, of the tail of the Scorpion asterism, are all described as the wildest of guesses in spite of their proper positions in the sequence.

However, I insist upon continuing my incorrigible career by adding that the Maya word *chikin*, sting sun, name of the west, refers to the sun in Scorpio in accord with the zodiacal scheme of the cardinal points explained above, hence its glyph is composed of the manik sign which represents the sting of the Scorpion, and the kin or sun sign.

Contrary to the statement on page 68 my paper on Teotihuacan is based upon personal study of the archaeological remains at that place. The genuine antiquity of the maps upon which that paper is based is vouched for by Professor Marshall H. Saville and they give a fairly accurate plan of the city.

I am unable to admit that the account of Lizana and the survey do not justify the deductions in my Izamal paper. This is again a matter of opinion, but in that paper I expressly disclaimed that all the deductions were proven.

On page 71 Doctor Spinden mentions other zodiacs unknown to me that have been "imagined" for other American Indian tribes. The late Major J. W. Powell also imagined that the festivals of various tribes of American Indians "are fixed at times indicated by the signs of the zodiac."<sup>1</sup>

Now as to intercommunication between the different zodiacs in America and between them and those of the eastern continent. The principal basis of the argument in favor of intercommunication is the same as for the existence of the zodiac, namely, the complex and artificial nature of the various zodiacal sequences combined with the marked analogies between all of them. No one doubts that wooden dwellings are erected by primitive peoples on different continents without intercommunication, because everywhere man

<sup>1</sup> Cushing, F. H., *Introduction to Zuñi Folk Tales*, p. xiv.

seeks protection from the rain and wood is usually the most abundant and easily obtained material for this purpose. Undoubtedly, many analogies in customs, languages, institutions, and rites are similarly explained as like results of like causes acting independently upon the same medium—the mind of man; but not all analogies can be thus explained. When one examines the members of the zodiacal series and realizes their artificial nature, the difficulty of explaining any one of them in the same manner for all times and places, and yet the similarity not of one or two, but of the entire series in sequence, to the writer's mind, in spite of admitted difficulties, it seems less miraculous to postulate intercommunication than to suppose that such analogies can be created by chance or by the law of like causes and like results. Probably there will be less opposition to the theory of intercommunication between the American zodiacs because of closer contiguity, racial identity, and the absence of an intervening ocean. Even Doctor Spinden asserts (p. 57) that agriculture spread from a single source over a large part of North and South America and carried with it certain ceremonies. Now the beginnings of the zodiac would probably synchronize closely with the beginnings of agriculture since it is closely associated with solar influence upon crops and this whether it is of native or foreign origin in America. Tribes of Mexican blood are now known to have been in contact with others of South American affinities near the Isthmus of Panama and Balboa heard of the Inca dominion at that point. The Maya contact with the Mexicans is an historic fact and as to the Pueblo ritual Mexican affinity or contact has been at least suspected by good authority.

The same principles apply to the question of intercommunication with the eastern continent but here, of course, the difficulties are much greater, even when confined to the accidental and sporadic communication, probably in ancient times, which alone seems possible.<sup>1</sup> Why did the foreigners bring only the zodiac, without food products, artifacts, or any material objects, why no religious, political, or other ideas? We must answer that as to material objects shipwrecked sailors would have none, while as to ideas

<sup>1</sup> Hagar, *American Anthropologist* (N.S.), vol. 14, pp. 43-48.

other than the zodiac it is by no means certain that they have not been received from the other continent; the probability lies the other way. But early navigators would be sure to emphasize the study of the stars and of the zodiac (p. 56). It is unfortunate that almost all the advocates of intercommunication have supported such ridiculous theories as naturally to prejudice the present scientific mind against the possibility of a rational defence of that view in any field, but, from the writer's viewpoint, some day the pendulum will swing back to the normal middle and this attitude will also be recognized as unscientific.

Dr. Spinden states the following objections to intercommunication: Scandinavian settlements in Greenland and communication with Labrador have left no traces upon the Northern Indians (p. 56). Granting this still uncertain statement, the northern tribes were not as receptive as the civilized peoples of South and Central America.

Analogous forms result from a unifying tendency acting upon differing sources, or convergent evolution as Dr. Spinden terms it, rather than from the opposite process or divergent evolution, therefore they did not originate from a single source. Uninitiates found phantastic theories on the former while savants confine their attention to the latter (pp. 56-57). But convergent evolution could not produce the complex zodiacal sequences.

Therefore I remain convinced of the existence of the zodiac described by me in various parts of America and of the strong probability that its correspondence with Oriental zodiacs is due to intercommunication at some time and place as yet unknown, or, possibly, at several times and places.<sup>1</sup>

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<sup>1</sup> Two other of my zodiacal papers not previously mentioned by Dr. Spinden or by me will be found in the *American Anthropologist* (N.S.), vol. 13, pp. 229-234; vol. 14, pp. 525-529.